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Forest Statistics
for the
North-Central
Section
of West Virginia

Northeastern Forest Experiment Station

Upper Darby, Pennsylvania
Ralph W. Marquis, Director

1953

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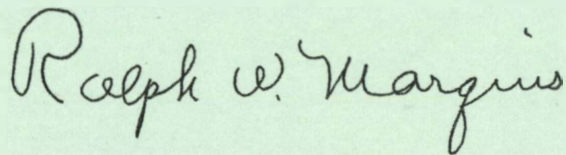
United States Department of Agriculture • • • Forest Service

FOREWORD

This is the seventh in a new series of preliminary reports about forest areas and timber volume in the State of West Virginia. It is a product of the forest survey of the Northeast, carried on by the Northeastern Forest Experiment Station as part of the Nation-wide forest survey being made by the Forest Service, U. S. Department of Agriculture.

The Forest Survey in West Virginia was carried out in collaboration with the West Virginia Conservation Commission. This agency provided the aerial photographs that were used and assigned personnel in a joint forest and game-habitat survey.

Field work in this section of West Virginia was supervised by Harry W. Camp, Jr. C. Allen Bickford developed the statistical procedures used in the survey. Computations were made under the supervision of Roland H. Ferguson.

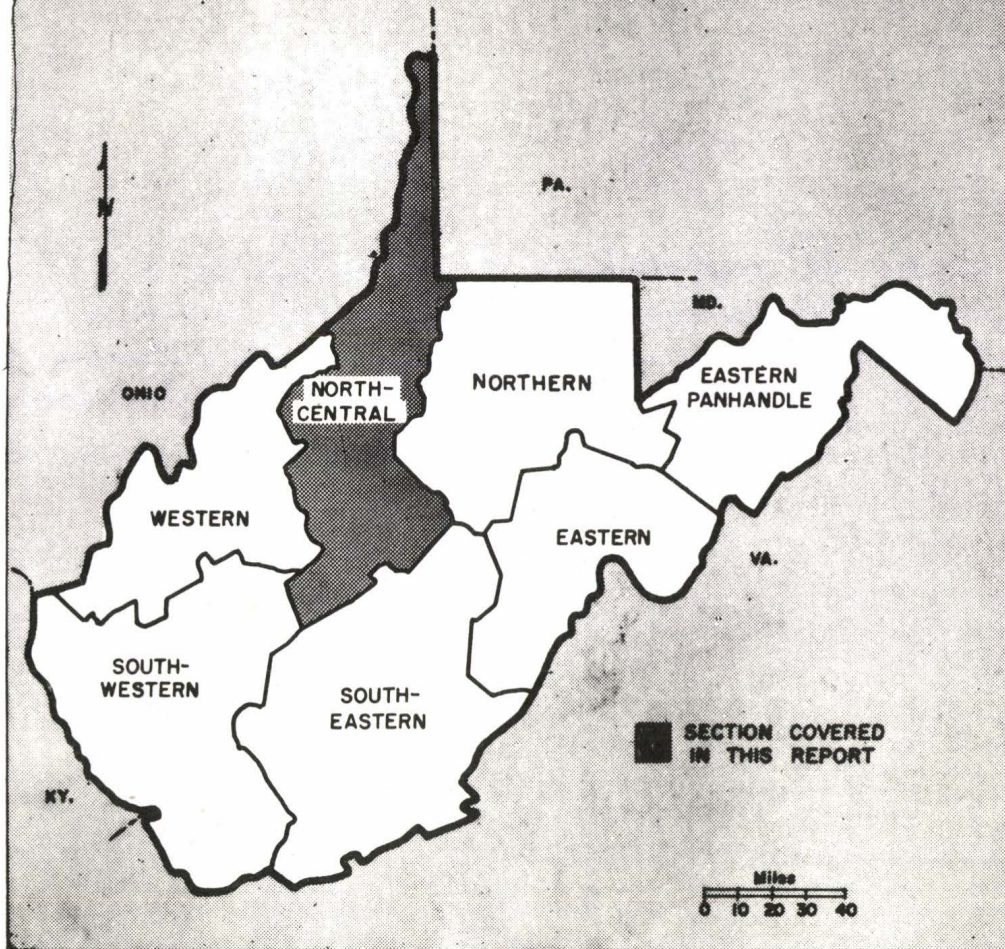
A handwritten signature in cursive script, reading "Ralph W. Marquis". The signature is written in dark ink and is positioned above the printed name and title.

Ralph W. Marquis
Director

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FOREST SURVEY UNITS
OF
WEST VIRGINIA



FOREST STATISTICS
FOR THE
NORTH-CENTRAL SECTION
OF WEST VIRGINIA

by

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GENERAL

The North-Central Section of West Virginia stretches from the northern panhandle of the State southward to the center. It contains 12 counties: Braxton, Brooke, Calhoun, Clay, Doddridge, Gilmer, Hancock, Marshall, Ohio, Ritchie, Tyler, and Wetzel.

The panhandle is highly industrialized and has little forest land. The proportion of forest land becomes greater and terrain rougher from north to south. In general, however, the topography is rolling to hilly.

The Forest Area

The total land area of these 12 counties is about 2.2 million acres. Fifty-three percent of this area is forested.

The forest area amounts to 1,179,900 acres. All but 2,000 acres of this land is available for commercial timber cutting.

Ownership

Ninety-nine percent of the commercial forest land in this section is held in private ownership, 45 percent by farmers and 54 percent by other private owners. Less than 7,000 acres are publicly owned. Most of this is in the Elk River State Game Refuge.

The Forest Types

Two-thirds of the commercial forest area is occupied by oak types, chiefly red oak. The yellow-poplar type covers 22 percent. The remaining 11 percent is divided between sugar maple-beech-yellow birch (4 percent) and the hard pine types (7 percent).

Condition Of The Forests

Thirty percent of the saw-timber volume is found on 8 percent of the forest land. This is the land that supports stands of more than 5,000 board feet per acre,

Light saw-timber stands (1,500 to 5,000 board feet per acre) occupy another 30 percent of the forest area. Pole-timber stands occupy 24 percent. The remaining 38 percent of the forest land has little or no stocking of commercial-size timber.

Timber Volume

The North-Central Section contains more than 1.8 billion board feet of saw timber. Thirty-nine percent of this volume is red oak. Less than 4 percent is softwood. The remaining volume is distributed among the various other hardwoods, chiefly chestnut oak, white oak, sugar maple, hickory, and beech.

(Although all of the volume reported above meets the requirements for saw timber, some of it may not be operable from a strictly business viewpoint. Operability depends upon species, quality, volume per acre, accessibility, markets, and so on. These are the things that determine whether one can cut timber and make money. However, it is not within the scope of this statistical report to distinguish between operable and inoperable timber stands. The purpose here is merely to report the total amount of timber that exists in this part of West Virginia. These statistics will be analyzed later in a comprehensive report for the entire State.)

The growing stock amounts to about 644 million cubic feet. Forty-six percent of this volume is in pole-timber trees; the rest is in saw-timber trees.

The total cubic volume is the equivalent of more than 8 million cords. About two-thirds of this volume is in trees of less than 15 inches' diameter.

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 1.--Land area and forest area, 1949

Class	Area	
	<u>Acres</u>	<u>Percent</u>
Forest land ¹ :		
Commercial	1,177,900	53
Noncommercial	2,000	(2/)
Total forest land	1,179,900	53
Nonforest land ³	1,029,400	47
All land ⁴	2,209,300	100

¹See Appendix for definitions.

²Less than 0.5 percent.

³Includes about 15,000 acres of water in areas less than 40 acres.

⁴From Areas of the United States 1950, Bureau of the Census.

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 2.--Land area and commercial forest area
by county, 1949

County	Land	Commercial forest	
	<u>Acres</u>	<u>Acres</u>	<u>Percent</u>
Braxton	330,800	170,400	52
Brooke	57,000	23,300	41
Calhoun	179,800	111,900	62
Clay	218,900	180,100	82
Doddridge	204,200	106,600	52
Gilmer	217,000	110,600	51
Hancock	52,500	26,200	50
Marshall	195,800	74,300	38
Ohio	68,500	21,900	32
Ritchie	289,300	142,900	49
Tyler	163,800	71,200	43
Wetzel	231,700	138,500	60
Total	2,209,300	1,177,900	53

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 3.--Commercial forest area
by ownership, 1949

Ownership	Area	
	<u>Acres</u>	<u>Percent</u>
Private:		
Farm forest land ¹	529,600	45
Other private	641,500	54
Total private	1,171,100	99
Public:		
State ²	6,700	1
County	100	(2/)
Total public	6,800	1
All ownerships	1,177,900	100

¹Census of Agriculture 1950.²Elk River State Game Refuge.³Less than 0.5 percent.

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 4.--Commercial forest area by
forest type, 1949

Forest type	Area	
	<u>Acres</u>	<u>Percent</u>
Red oak	614,800	52
Chestnut oak	96,000	8
White oak	79,700	7
Yellow-poplar	260,800	22
Sugar maple-beech-yellow birch	49,600	4
Hard pine types	77,000	7
All types	1,177,900	100

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 5.--Commercial forest area by
stand-size class, 1949

Stand-size class	Area	
	<u>Acres</u>	<u>Percent</u>
Saw-timber stands:		
More than 5,000 bd.ft. per acre	91,200	8
1,500-5,000 bd.ft. per acre	356,700	30
Pole-timber stands:		
More than 600 cu.ft. per acre	180,000	15
200-600 cu.ft. per acre	100,300	9
Other stands	449,700	38
All stands	1,177,900	100

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 6.--Net volume of live timber on commercial forest land by species, 1949

Species	Growing stock		Saw timber ¹
	<u>Thousand cu.ft.</u>	<u>Equivalent in cords²</u>	<u>Thousand bd.ft.</u>
Red oak	192,500	2,406,200	716,700
Chestnut oak	76,700	958,800	204,700
White oak	64,300	803,700	146,300
Sugar maple	31,300	391,200	111,000
Hickory	52,500	656,200	105,700
Beech	27,800	347,500	103,100
Yellow-poplar	40,300	503,800	85,300
Basswood	23,000	287,500	60,700
Gum	11,300	141,200	49,900
Elm	20,200	252,500	43,700
Ash	20,000	250,000	32,100
Red maple	9,900	123,700	17,100
Other hardwood	54,300	678,900	97,800
All hardwood	624,100	7,801,200	1,774,100
White pine	7,400	92,500	40,800
Hard pine	11,000	137,500	17,600
Hemlock	1,200	15,000	15,300
All softwood	19,600	245,000	73,700
All species ³	643,700	8,046,200	1,847,800

¹International $\frac{1}{4}$ -inch log rule.²Rough standard cords. 1 cord = 80 cubic feet.³In addition there are 84 million cubic feet (net volume) in live cull trees.

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 7.--Net volume of live timber on commercial forest land by diameter class, 1949

Diameter class ¹ (inches at breast height)	Growing stock	Saw timber
	<u>Thousand cu.ft.</u>	<u>Thousand bd.ft.</u>
Hardwood:		
6	72,000	---
8	95,600	---
10	120,900	---
12	71,000	298,600
14	66,800	329,600
16	63,000	340,500
18	44,100	247,500
20	36,600	218,500
22	16,700	102,500
24	15,600	95,100
26	11,800	74,500
28 and larger	10,000	67,300
All hardwood	624,100	1,774,100
Softwood:		
6	2,600	---
8	2,200	---
10	2,400	8,400
12	3,100	13,200
14	3,000	13,700
16 and larger	6,300	38,400
All softwood	19,600	73,700
Softwood and hardwood	643,700	1,847,800

¹The midpoint of each 2-inch diameter class is indicated.

NORTH-CENTRAL SECTION OF WEST VIRGINIA

Table 8.--Average net volume per acre of live timber
on commercial forest land, by stand-size
class, 1949

Stand-size class	Growing stock	Saw timber
	<u>Cu.ft.</u>	<u>Bd.ft.</u>
Saw-timber stands:		
More than 5,000 bd.ft. per acre	1,390	6,030
1,500-5,000 bd.ft. per acre	860	2,690
Pole-timber stands:		
More than 600 cu.ft. per acre	620	870
200-600 cu.ft. per acre	340	620
Other stands	140	260
All stands ¹	550	1,570

¹Hardwood constitutes 96 percent of the total board-foot volume, or 97 percent of the total cubic-foot volume.

APPENDIX

DEFINITIONS OF TERMS

Forest Area

Forest land area.--Includes (a) lands that are at least 10 percent stocked by trees of any size and capable of producing timber or other wood products, or of exerting influence on the climate or on the water regime; (b) land from which the trees described in (a) have been removed to less than 10 percent stocking and which has not been developed for other use; and (c) afforested areas. (Forest tracts of less than 1 acre and isolated strips of timber less than 120 feet wide are excluded.)

Commercial forest land area.--Forest land that is (a) producing, or physically capable of producing, usable crops of wood (usually saw timber), (b) economically available now or prospectively, and (c) not withdrawn from timber utilization.

Noncommercial forest land area.--Forest land (a) withdrawn from timber utilization through statute, ordinance, or administrative order, but that otherwise qualifies as commercial forest land, or (b) incapable of yielding usable wood products (usually saw timber) because of adverse site conditions, or so physically inaccessible as to be unavailable economically in the foreseeable future.

Forest Types

Forest types are defined according to the species, or species group, that make up the major portion of the stand in terms of board feet in saw-timber stands or number of stems in other stands. In general, the type names are self-explanatory. "Hard pine types" include hard pine-oak and pitch pine, Virginia pine, and shortleaf pine.

Stand-Size Classes

Saw-timber stands.--Stands with saw-timber trees having a minimum net volume per acre of 1,500 board feet, International $\frac{1}{4}$ -inch rule.

Pole-timber stands.--Stands failing to meet the saw-timber stand specification, but at least 10 percent stocked with pole-timber and larger trees (5.0 inches d.b.h. and larger), and with at least half the minimum stocking in

pole-timber trees. (Pole-timber stands carry at least 200 cubic feet per acre.)

Other stands.--Forest stands that do not qualify as saw-timber or pole-timber; stands of seedlings and saplings; nonstocked areas.

Tree Classes.

Saw-timber trees.--Trees of commercial species that contain at least one merchantable sawlog as defined by regional practice and which are of the following minimum diameters at breast height (d.b.h.): Softwoods 9.0 inches and hardwoods 11.0 inches. (All butt sawlogs are considered merchantable. Where the butt is defective, upper sawlogs are considered merchantable if they account--in terms of aggregate volume--for 50 percent or more of the gross volume below the top of the uppermost sawlog. Softwood sawlogs are at least 6 inches in diameter, inside bark at small end; 8 to 16 feet in length; sound and straight enough to be manufactured into standard lumber. The smaller logs are generally free of surface defects other than small tight knots. Hardwood sawlogs are at least 8 inches in diameter, inside bark at small end; 8 to 16 feet in length; suitable for sawing into standard lumber, construction timber, or ties.)

Pole-timber trees.--Trees 5.0 inches d.b.h. and larger of commercial species that do not meet the specifications for saw-timber trees but do meet regional specifications of species, soundness, and freedom from defect. (These are the trees that are straight and clear enough to make saw-timber trees eventually.)

Seedling and sapling trees.--Trees of commercial species less than 5.0 inches d.b.h.

Cull trees.--Live trees of saw-timber or pole-timber size that are unmerchantable for sawlogs now or prospectively because of defect, rot, or species.

Timber Volume

Growing stock.--Net volume, in cubic feet, of live saw-timber trees and live pole-timber trees from stump to a minimum 4.0 inch top (of central stem) inside bark.

(This volume is also given in rough, standard cords, bark included. Cord volume is derived from cubic-foot volume by applying a factor of 80 cubic feet per cord.)

Live saw-timber volume.--Net volume in board feet, International $\frac{1}{4}$ -inch rule, of live saw-timber trees.

FOREST SURVEY METHODS

These forest statistics for the North-Central Section of West Virginia are based on information gathered from sample plots. These plots are distributed randomly over the entire area.

They were first located on aerial photographs. Trained photo interpreters then examined the photos and classified each forest plot according to stand size. Field crews inspected enough plots on the ground to attain a specified level of statistical accuracy. Species and volume data were collected on these ground plots.

The survey was designed for maximum accuracy in the estimate of total merchantable cubic volume.

ACCURACY OF THE ESTIMATES

The estimates in this report may contain two kinds of error.

First, photo interpreters may make mistakes of judgment and fieldmen may make mistakes in measuring or recording. There is no practical way of finding out just how often such errors occur. But they are kept to a minimum by closely checking all phases of the work.

The second kind of error is associated with sampling procedures. The size of this error can be measured. In this section the chances are 2 to 1 that the error will not exceed 2.5 percent of the total forest area, 7.9 percent of the total board-foot volume, or 7.4 percent of the total cubic-foot volume.

These percentages show that the area estimates are more reliable than the volume estimates, and that our cubic-foot estimates are more reliable than the board-foot estimates.

In each of the tables, the total figures are more reliable than the subtotals. The subtotals are more reliable than any of the individual figures. Figures that are small in relation to totals are subject to larger sampling errors.

SPECIES TALLIED

The various commercial tree species tallied in the North-Central Section of West Virginia are listed below.¹ Approved common names are shown in parentheses if these differ from the brief name used in the tables.

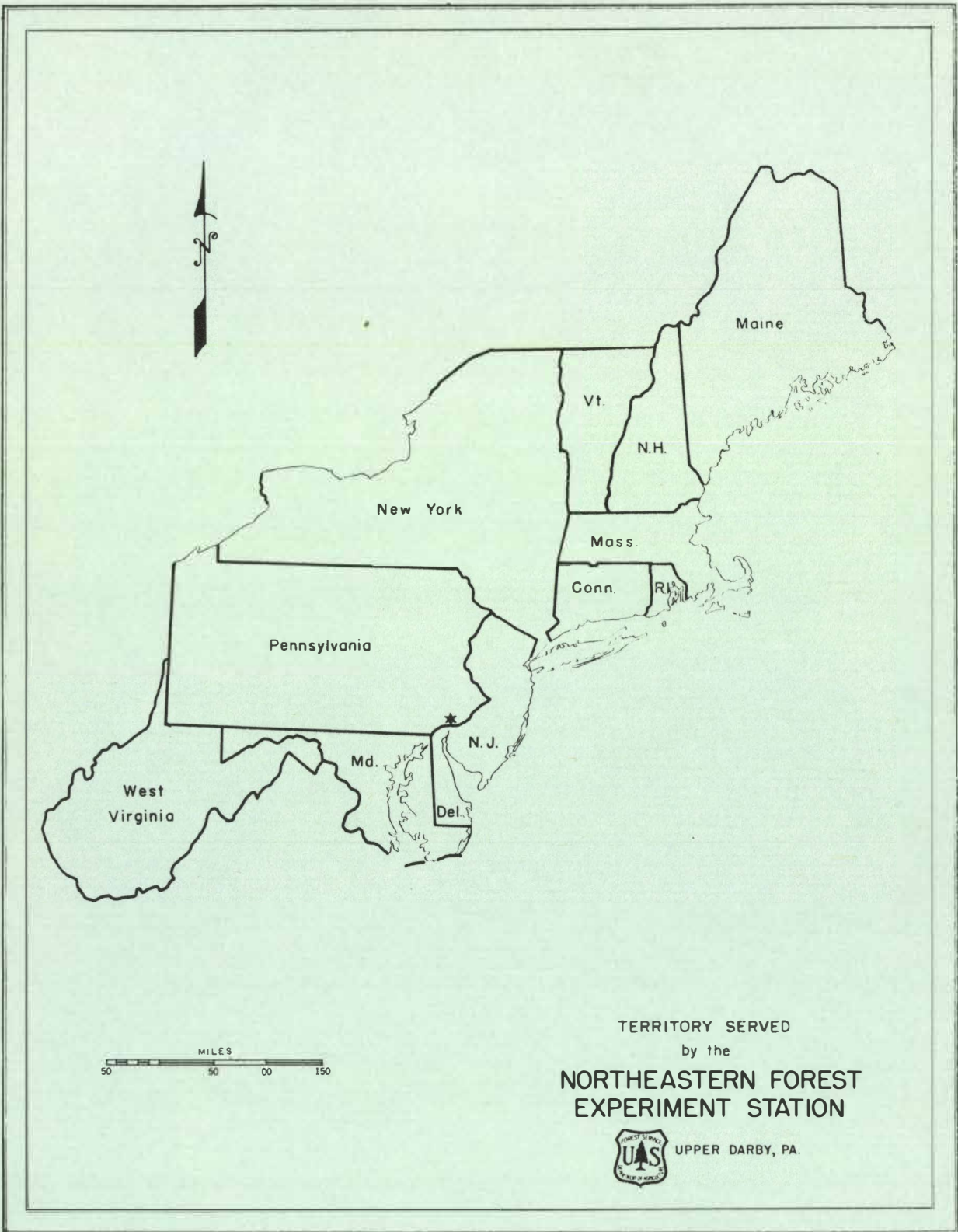
Hardwoods.

Red oak (Northern red oak)	- <u>Quercus borealis</u>
(Black oak)	- <u>Quercus velutina</u>
(Scarlet oak)	- <u>Quercus coccinea</u>
Chestnut oak	- <u>Quercus montana</u>
White oak	- <u>Quercus alba</u>
Sugar maple	- <u>Acer saccharophorum</u>
Hickory	- <u>Carya species</u>
Beech (American beech)	- <u>Fagus grandifolia</u>
Yellow-poplar	- <u>Liriodendron tulipifera</u>
Basswood (American basswood)	- <u>Tilia americana</u>
Gum (Blackgum)	- <u>Nyssa sylvatica</u>
Elm	- <u>Ulmus species</u>
Ash	- <u>Fraxinus species</u>
Red maple	- <u>Acer rubrum</u>
Other hardwoods	
(Yellow birch)	- <u>Betula lutea</u>
(Sweet birch)	- <u>Betula lenta</u>
(River birch)	- <u>Betula nigra</u>
(Black cherry)	- <u>Prunus serotina</u>
(Pin cherry)	- <u>Prunus pennsylvanica</u>
(Bigtooth aspen)	- <u>Populus grandidentata</u>
(Cucumbertree)	- <u>Magnolia acuminata</u>
(Black walnut)	- <u>Juglans nigra</u>
(Butternut)	- <u>Juglans cinerea</u>
(Black locust)	- <u>Robinia pseudoacacia</u>
(American sycamore)	- <u>Platanus occidentalis</u>
(Silver maple)	- <u>Acer saccharinum</u>
(Black willow)	- <u>Salix nigra</u>
(Yellow buckeye)	- <u>Aesculus octandra</u>

Softwoods

White pine (Eastern white pine)	- <u>Pinus strobus</u>
Hard pine (Pitch pine)	- <u>Pinus rigida</u>
(Virginia pine)	- <u>Pinus virginiana</u>
(Shortleaf pine)	- <u>Pinus echinata</u>
Hemlock (Eastern hemlock)	- <u>Tsuga canadensis</u>

¹U.S. FOREST SERVICE. CHECK LIST OF THE NATIVE AND NATURALIZED TREES OF THE UNITED STATES INCLUDING ALASKA. 325 PP. WASHINGTON. 1949.



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